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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/262,912	03/05/1999	TAPANI VUORINEN	30-497	1188

7590

04/08/2002

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EXAMINER

ALVO, MARC S

ART UNIT	PAPER NUMBER
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1731

19

DATE MAILED: 04/08/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/262,912

Applicant(s)

VUORINEN ET AL.

Examiner

Steve Alvo

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 21-40 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 21-40 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 18.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 21, 26-28, 30-32, 34 and 39 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over WO 91/05909.

WO 91/05909 teaches bleaching kraft pulp in a first 0.4% to 1.0% (Table 2 on pages 14 and 15) chlorine dioxide (1.05 to 2.63% active chlorine) in a chlorine dioxide bleaching step for a time of 5 minutes at a temperature of 85°C (over 70°C) a pH maintained between 6.0 and 7.5 (e.g. over 4.0 or 5.0), then adding acid to reduce the pH to 3.8 and bleaching in a second chlorine dioxide step at a temperature of 85°C (over 80°C) for ^{2.5-3.9 hrs (150-234 min)} (120 minutes or more) See WO 91/05909, page 8, line 23- page 9, line 15. If WO 91/05909 does not teach the exact claimed conditions then such would have been obvious to the routineer to optimize the bleaching. For example, it is known that higher temperature decrease the bleaching time required to obtain a certain brightness. Thus it would have been obvious to one of ordinary skill in the art that at in the first stage of WO 91/05909 when using the highest disclosed (85°C) temperature to use the shortest reaction time (5 minutes). It would have been obvious that even higher temperatures would result in even shorter reaction times. WO 91/05909 teaches using sequences which include a second chlorine dioxide stage. See Tables 1-3 of WO 91/05909 for chlorine dioxide dosage of 0.5-1.5% in the first chlorine dioxide stage and 0.5 to 2.0% in the second stage. It would have

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been obvious to perform the bleaching and acid adjusting steps in inlet lines and/or reactors as such is taught by WO 91/05909, e.g. initial D step in inlet line reacted in upflow reactor and/or J or U tube, acid added to reactor and/or J or U tube outlet line and last chlorine dioxide step occurs in downflow reactor. It would have been obvious to use chlorine dioxide in the first stage as WO 91/05909 teaches the process could be carried out on any D bleaching stage process (page 4, lines 8-10).

Claims 21, 26-28, 30-32, 34 and 39 are rejected under 35 U.S.C. 103(a) as obvious over *or Bhattacharjee or Lachapelle* WO 91/05909 in view of WO 96/12063.

WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE teach that alternativeness of using chlorine dioxide for chlorine in TCF (totally chlorine free) bleaching processes to prevent discharge of chlorinated organics, e.g. dioxins. It would have been especially obvious to use chlorine dioxide in the first stage of WO 91/05909 to prevent discharge of chlorinated organics as taught by WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE. This would have been especially obvious as WO 91/05909 teaches the process could be carried out on any D bleaching stage process (page 4, lines 8-10). This would include the TCF processes of WO 96/12063 (page 7, line 19), instead of the CD(EO)DED process of WO 91/05909. It would have been especially obvious to use higher temperatures and shorter acid treatment times, in the acid stage of WO 91/05909, as such an acid treatment is taught by WO 96/12063. It is noted that such an acid treatment can come before or after the chlorine dioxide stage, e.g. see WO 96/12063, page 10, lines 17-20. It would thus have been obvious to place the acid stage after the first D stage and before the second D stage in a DEDED bleaching sequence. WO 96/12063 an acid treatment, also known as a hot acid step, method for pulp by which the consumption of

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chlorine dioxide can be reduced. This treatment removes hexenuronic acids, which can react with chlorine dioxide and thus increase chemical consumption, from the pulp. It would have been obvious to perform the acid treatment of WO 91/12063 to decrease consumption of chlorine dioxide by removing hexenuronic acids as taught by WO 96/12063.

Claims 21, 26-28, 30-32, 34 and 39 are rejected under 35 U.S.C. 103(a) as obvious over WO 91/05909 in view of WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE in view of WO 96/12063.

WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE teach that alternativeness of using chlorine dioxide for chlorine in TCF (totally chlorine free) bleaching processes to prevent discharge of chlorinated organics, e.g. dioxins. It would have been especially obvious to use chlorine dioxide in the first stage of WO 91/05909 to prevent discharge of chlorinated organics as taught by WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE. This would have been especially obvious as WO 91/05909 teaches the process could be carried out on any D bleaching stage process (page 4, lines 8-10). This would include the TCF processes of WO 96/12063 (page 7, line 19) or BHATTACHARJEE et al or LACHAPELLE, e.g. using the D(EO)DED process disclosed by LACHAPELLE (page 181, column 2) instead of the CD(EO)DED process of WO 91/05909. It would have been especially obvious to use higher temperatures and shorter acid treatment times, in the acid stage of WO 91/05909, as such an acid treatment is taught by WO 96/12063. It is noted that such an acid treatment can come before or after the chlorine dioxide stage, e.g. see WO 96/12063, page 10, lines 17-20. It would thus have been obvious to place the acid stage after the first D stage and before the second D stage in a DEDED bleaching sequence. . WO 96/12063 an acid treatment, also known as a hot acid step,

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method for pulp by which the consumption of chlorine dioxide can be reduced. This treatment removes hexenuronic acids, which can react with chlorine dioxide and thus increase chemical consumption, from the pulp. It would have been obvious to perform the acid treatment of WO 91/12063 to decrease consumption of chlorine dioxide by removing hexenuronic acids as taught by WO 96/12063.

Claims 22-24 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of BHATTACHARJEE et al or LACHAPELLE as applied to claim 21 above, and further in view of VUORINEN et al or WO 96/12063.

WO 91/05909 teaches maintaining the pH during the first step between 6.0 and 7.5 (over 5.0). VUORINEN et al teaches that hexenuronic acids react with the ene functionality of hexenuronic acid groups and that this can be prevented by converting the hexenuronic acid groups to 2-furoic plus formic acids and 5-carboxy-2-furaldehyde through acid hydrolysis. It would have been obvious to improve the brightness stability of the pulp of WO 91/05909 by removing the hexenuronic acids by performing an acid hydrolysis in the manner taught by VUORINEN et al. . Or WO 96/12063 an acid treatment, also known as a hot acid step, method for pulp by which the consumption of chlorine dioxide can be reduced. This treatment removes hexenuronic acids, which can react with chlorine dioxide and thus increase chemical consumption, from the pulp. It would have been obvious to perform the acid treatment of WO 91/12063 to decrease consumption of chlorine dioxide by removing hexenuronic acids as taught by WO 96/12063.

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Claims 22-24 and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of WO 96/12063 as applied to claim 21 above, and further in view of VUORINEN et al.

WO 91/05909 teaches maintaining the pH during the first step between 6.0 and 7.5 (over 5.0). VUORINEN et al teaches that hexenuronic acids react with the ene functionality of hexenuronic acid groups and that this can be prevented by converting the hexenuronic acid groups to 2-furoic plus formic acids and 5-carboxy-2-furaldehyde through acid hydrolysis. It would have been obvious to improve the brightness stability of the pulp of WO 91/05909 by removing the hexenuronic acids by performing an acid hydrolysis in the manner taught by VUORINEN et al. . WO 96/12063 an acid treatment, also known as a hot acid step, method for pulp by which the consumption of chlorine dioxide can be reduced. This treatment removes hexenuronic acids, which can react with chlorine dioxide and thus increase chemical consumption, from the pulp. It would have been obvious to perform the acid treatment of WO 91/12063 to decrease consumption of chlorine dioxide by removing hexenuronic acids as taught by WO 96/12063.

Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of WO 96/12063 as applied to claim 21 above, and further in view of DEVENYNS et al.

DEVENYNS et al teaches using a chelating agent after a chlorine dioxide stage to remove metal ions from the pulp prior to a peroxide bleaching stage. It would have been obvious if the pulp is to be further bleached with peroxide to treat the pulp with a chelating agent as taught by DEVENYNS et al.

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Claim 29 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of BHATTACHARJEE et al or LACHAPELLE and WO 96/12063 as applied to claim 21 above, and further in view of DEVENYNS et al.

DEVENYNS et al teaches using a chelating agent after a chlorine dioxide stage to remove metal ions from the pulp prior to a peroxide bleaching stage. It would have been obvious if the pulp is to be further bleached with peroxide to treat the pulp with a chelating agent as taught by DEVENYNS et al.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of 96/12063 and VUORINEN et al as applied to claim 24 above, and further in view of HISTEAD et al.

HISTEAD et al teaches using chlorine dioxide bleaching times decrease at higher temperatures (see section on page 41 (T36) under Table I) and teaches at 80°C that a reaction time of 2 minutes can be used. It would have been obvious to use the 2 minute reaction time of HISTEAD et al for the first step of WO 91/05909.

Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of BHATTACHARJEE et al or LACHAPELLE and VUORINEN et al or WO 96/12063 as applied to claim 24 above, and further in view of HISTEAD et al.

HISTEAD et al teaches using chlorine dioxide bleaching times decrease at higher temperatures (see section on page 41 (T36) under Table I) and teaches at 80°C that a reaction time of 2 minutes can be used. It would have been obvious to use the 2 minute reaction time of HISTEAD et al for the first step of WO 91/05909.

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Claims 38 is rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of 96/12063 or BHATTACHARJEE et al or LACHAPELLE and VUORINEN et al or WO 96/12063 as applied to claim 4 above, and further in view of CARLES et al.

It would have been obvious to one of ordinary skill in the art to use chlorine dioxide temperatures of up to 90°C during the chlorine dioxide bleaching steps of WO 91/05909 as such is taught by CARLES et al.

Claims 33, 40 and 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over WO 91/05909 in view of BHATTACHARJEE et al or LACHAPELLE and VUORINEN et al or WO 96/12063 and CARLES et al as applied to claim 38 above, and further in view of HISTEAD.

HISTEAD et al teaches using chlorine dioxide bleaching times decrease at higher temperatures (see section on page 41 (T36) under Table I) and teaches at 80°C that a reaction time of 2 minutes can be used. It would have been obvious to use the 2 minute reaction time of HISTEAD et al for the first step of WO 91/05909.

Applicant has previously argued that the acid treatment is solely an acid step and only contains residual chlorine dioxide. However, the specification on page 7, lines 7-9 and original claim 1 call for "(b) in the chlorine dioxide stage effecting an acid treatment". There is no disclosure that all the chlorine dioxide is consumed before the acid is added. The acid treatment would take place in the presence of at least some chlorine dioxide. The instant claims nor the instant disclosure do not indicate how much chlorine dioxide remains with the pulp during acid treatment. Thus the claims of the instant case do not distinguish over the acid addition of WO/05909.

Applicant's previous argument that the 0.6% chlorine dioxide of WO/05909 is equivalent to 1.58% active chlorine is not convincing as the claims use the term "about". The 1.58% is

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within the claimed "about" 1.5% active chlorine of claim 1. Besides the Table on page 3 uses 0.4% chlorine dioxide. This is equivalent to 1.05% active chlorine using the 2.63 multiplier argued by Applicant and within the claimed "about 0.5 to 1.0%" claimed by Applicant. The term "about" permits some tolerance, and therefore encompasses values on either side of the claimed value (number). *In re Pampas*, 214 F.2d, 176-177, 102 USPQ 298, 301 (CCPA); *In re De Vaney*, 185 F. 2d 679, 683, 88 USPQ 97, 101 (CCPA 1950); *In re Ayers*, 154 F.2d 182, 185, 69 USPQ 109, 112 (CCPA 1946).

The argument that the DAD sequence is not obvious from WO 91/05909 is not convincing for the reasons set forth above. Besides independent claims 21 and 35 are not limited to a DAD bleach sequence. The claims claim a part of a sequence not an entire sequence and they are only limited to DA not DAD.

The argument that 91/05909 has an initial CD-stage is not convincing. 91/05909 teaches that the process can be used on any D bleaching stage, see page 4, lines 7-10. This would include the DEDED bleaching stages of WO 96/12063 or BHATTACHARJEE et al or LACHAPELLE. Besides 91/05909 shows in Figures 15A and 15B that chlorine dioxide can be used without elemental chlorine.

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

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however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

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Any inquiry concerning this communication or earlier communications from the **primary examiner** should be directed to **Steve Alvo** whose telephone number is (703) 308-2048. The Examiner can normally be reached on Monday - Friday from 6:00 AM - 2:30 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mr. Stanley Silverman, can be reached on 703-308-3837.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the **Group receptionist** whose telephone number is (703) 308-0661.

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MSA
April 7, 2002



STEVE ALVO
PRIMARY EXAMINER
ART UNIT 1731